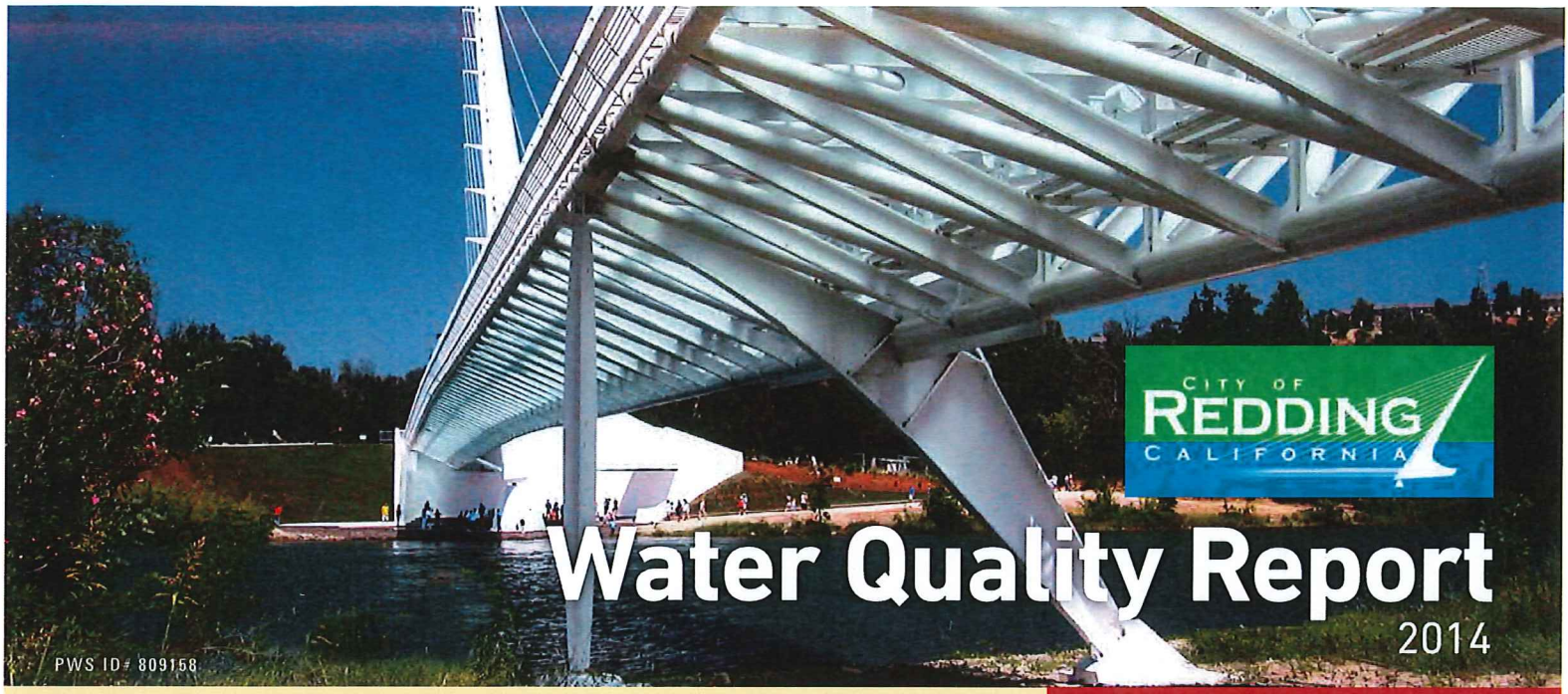


Water Quality Report

2014

THE CITY OF REDDING PROVIDES exceptional water to you!

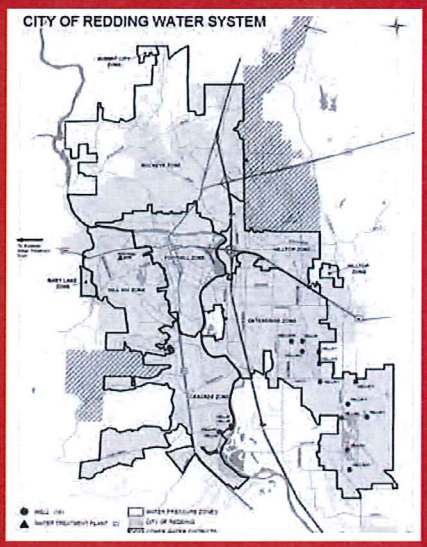
The City of Redding Public Works Water Utility is pleased to present to you the 2014 Consumer Confidence Report (CCR). The report is designed to inform our water customers with summary information on the water quality of the City's water supply sources, the levels of any detected contaminants, and compliance with drinking water regulations. The CCR is prepared and distributed to the City's water customers each year, in accordance with State and Federal regulations for electronic delivery. The information contained in this report was taken from water analysis performed through December 2014. We test the drinking water quality for many constituents as required by State and Federal Regulations to ensure that the water supplied to our customers consistently meets both Federal and State Water Quality Standards. Last year your tap water met all U.S. Environmental Protection Agency (USEPA) and State drinking water health standards. However five of the ten Enterprise groundwater wells, which are operated approximately six months out of the year, did exceed the maximum contaminant level for manganese, which is a secondary drinking water standard. Secondary standards are established for contaminants that do not cause adverse health effects, but do diminish the esthetic quality of the water.

We would like all our customers to have current and factual information about our drinking water. To that end, water customers who receive this report are asked to share this information with any tenant or water user on the premise. The CCR can be accessed from the Water Utility web page at http://www.reddingutilities.com/water.html, or if you wish to have a copy mailed to you please contact the City Public Works Water Utility at (530) 224-6068.

We welcome public participation in water quality issues. Information that deals with decisions about our water system is addressed during Redding City Council Meetings. These meetings are held the first and third Tuesday of each month at 6:00 p.m. in the City Council Chambers at City Hall. The address is 777 Cypress Avenue, Redding. Council information can be accessed on web page at http://www.redding.ca.us/council/council.html.

We are available to answer questions and provide information if needed. Please see the contact information below.

AS CALIFORNIA'S DROUGHT CONTINUES, THE GOVERNOR OF CALIFORNIA AND THE CITY OF REDDING WATER UTILITY CALLS FOR YOUR MANDOTORY REDUCTION OF WATER USAGE BY 36%!



HOW TO CONTACT US:

Utility Customer Service & Billing:
(530) 339-7200

Leak Reports:
(530) 224-6068

Water Conservation Materials:
(530) 224-6032

Water Quality Concerns:
(530) 224-6068

General Information:
(530) 224-6068

Water Quality Information:
(530) 225-4475

Drought Information Posted on the Water Utility Website: http://www.reddingutilities.com/water.html

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda b ien

A Message from the Water Utility Manager

Your health and the health of the Redding community is important to us. We are proud of the fact that your water utility not only meets stringent Federal and State Water Quality standards each and every day of the year, but in most cases, contaminant levels fall far below published Primary and Secondary Standards. This means that you, the consumer, are assured of the safest water we can deliver to your home or business.

Through careful management of our resources and prudent business decisions, we will continue investigate and develop additional water sources and bring you the highest quality water at the lowest possible cost, now and in the future.

As a division of the City of Redding Public Works, the Water Utility's mission is to provide our customers with a reliable supply of high quality drinking water. The Water Utility work force is made up of highly trained, well equipped certified operators that are dedicated to achieving their primary mission. Operations staff members monitor the system 365 days a year and stand ready to respond to both routine and emergency conditions. Undersized and aging pipelines are being replaced systematically in the order of priority within the basic framework of the Water Utility Master Plan. Continued investment in capital facilities such as distribution pipelines, reservoirs, pump stations, water treatment plants and groundwater wells are necessary to maintain the current level of service to our customers.

Towards that end, 25 full time employees maintain approximately 558 miles of water mains, 29,225 metered service connections, one 24 MGD surface water treatment plant, one 14 MGD surface water treatment plant, 16 groundwater wells, one raw

water pump station, nine booster pump stations, eleven reservoirs totaling 32.7 million gallons of storage, four supervisory valve stations, eleven pressure reducing stations, six pressure zones and serve approximately 85,000 people within a service area of approximately 60 square miles.

If you have any questions or need additional information on the City of Redding Water System please feel free to contact us at (530) 224-6068.

Source Water Assessment

The City of Redding conducted source water assessments for its surface water in July 2001 and groundwater sources in May 2002. The source water assessment identifies possible activities in the vicinity of each source that could affect the water quality of that source. The sanitary survey for our surface water sources was updated in June 2011. For more information on the source water assessment or sanitary survey, please contact the City Public Works Water Utility at (530) 224-6068 or SWRCB Division of Drinking Water, Field Operations Branch at (530) 224-4800.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses and bacteria, which may come from wastewater treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- **Pesticides and herbicides**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- **Radioactive contaminants**, which can be naturally-occurring or be the result of oil and gas production and mining activities.
- **Arsenic:** While your drinking water meets the federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The USEPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.
- **Nitrate** in drinking water at levels above 45 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 45 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Water Quality Standards and Testing Results

In order to ensure that tap water is safe to drink, the USEPA and the SWRCB prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. SWRCB regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

The City's water supplies must meet stringent water quality standards that are set forth by the USEPA and the SWRCB. The tables on the following pages list all of the drinking water contaminants that were detected during sampling over the past several years. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. SWRCB allows monitoring for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though representative of the water quality, are more than one year old.

Additional General Information on Drinking Water

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791) or on their website at http://www.epa.gov/safewater.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the USEPA website.

Infants, young children, and pregnant women are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of the materials used in your home's plumbing. If your water faucet has not been used for several hours, you can minimize the potential for lead exposure by flushing the faucet for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested. Additional information is available from the USEPA Safe Drinking Water Hotline (1-800-426-4791) or at http://www.epa.gov/safewater/lead.

As part of the USEPA Unregulated Contaminant Monitoring Rule (UCMR 3) program, the City is collecting and analyzing two sets of samples for the 2nd and 3rd quarters, between March 2014 and July 2014. Samples are collected from finished water from both of our surface water treatment plants and groundwater well system sites representing the entire water system. Perfluorinated compounds, synthetic organic compounds, volatile organic compounds, six metals and one oxyhalide anion were analyzed in the UCMR 3 monitoring. The USEPA has not established maximum contaminant levels (MCL) for these unregulated contaminants, and the human health effects of these contaminants at the levels they were found is unclear. In the absence of MCLs and health standards, published guidance or health reference levels are available from the USEPA's Safe Drinking Water Hotline (1-800-426-4791) or on their website at http://www.epa.gov/safewater. This data will serve as a primary source of occurrence and exposure information that the agency uses to develop regulatory decisions.

Water Supply Sources

Water sources include surface water from the Sacramento River and Whiskeytown Reservoir which made up 67% of the treated water supply, or approximately 5.35 billion gallons. The groundwater from the Redding Groundwater Basin made up 33% of the treated water supply, or approximately 2.67 billion gallons. The two surface water treatment plants and sixteen groundwater wells supply water to the City of Redding service area. The water system is divided into six pressure zones: Enterprise (east), Cascade (south), Foothill (central), Hilltop-Dana (northeast), Hill 900 (west), and Buckeye (north). The Hill 900 and Foothill zones are supplied with surface water from the Sacramento River via the Foothill Water Treatment Plant (FWTP). The Enterprise and Cascade zones are supplied by a blend of well water and water from the Foothill zone. The Buckeye zone is supplied with surface water from Whiskeytown Reservoir via the Buckeye Water Treatment Plant (BWTP) and water from the Foothill Zone. The Hilltop-Dana zone is supplied with water from both the Enterprise and Buckeye zones. These pressure zones are shown on the City of Redding Water System diagram displayed on page 9. City water is considered soft, with low to moderate alkalinity, and comparatively trace levels of disinfection byproducts.

Groundwater Quality

Five of the wells in the Enterprise zone have elevated iron and manganese levels that can form black mineral deposits in the distribution system. A sequestrant/corrosion inhibitor (blend of orthophosphate and polyphosphate) is added at these wells to keep the minerals dissolved and minimize deposits in the piping. Areas supplied by well water are flushed through a Unidirectional Flushing Program to remove accumulated deposits that can cause "discolored water". A comprehensive blending and sampling plan has been developed with State Water Resources Control Board (SWRCB), Division of Drinking Water to ensure drinking water standards are met. While Arsenic has been detected in some of our groundwater sources are in compliance with the Division of Drinking Water's MCL. Compliance with this MCL for arsenic is determined based on a running quarterly average of the testing results. The arsenic MCL was reduced from 50 ppb to 10 ppb on January 23, 2006 by the USEPA.

2014 SAMPLING RESULTS

Sampling results showing TREATMENT OF SURFACE WATER SOURCES

Treatment Technique (Type of approved filtration technology used):	Conventional treatment (coagulation, sedimentation, and filtration) and direct filtration (coagulation and filtration) in combination with chlorination
Turbidity Performance Standards (that must be met through the water treatment process)	Turbidity of the filtered water must: 1 – Be less than or equal to 0.3 NTU in 95% of measurements in a month 2 – Not exceed 1.0 NTU for more than eight consecutive hours 3 – Not exceed 5.0 NTU at any time
Lowest monthly percentage of four-hour samples that met Turbidity Performance Standard No. 1.	Foothill WTP: 99.9% were less than or equal to 0.3 NTU Buckeye WTP: 99.9% were less than or equal to 0.3 NTU
Highest single instantaneous turbidity measurement during the year.	0.29 NTU (0.02 to 5.0 NTU range) for Foothill Water Treatment Plant 0.25 NTU (0.02 to 5.0 NTU range) for Buckeye Water Treatment Plant
Number of violations of any surface water treatment requirements.	None

Note: Turbidity (measured in NTU) is a measurement of the cloudiness of water. Monitoring turbidity is a good indicator of water quality and to verify compliance and effectiveness of our water filtration systems and disinfectants.

Sampling results showing the detection of coliform bacteria

Microbiological Contaminants	Highest No. of Detections	No. of Months in Violation	MCL	MCLG	Typical Source of Bacteria
Total Coliform Bacteria (Total Coliform Rule)	1 (In a month)	0	Greater than 5% of monthly samples positive.	0	Naturally present in the environment
Fecal Coliform or E. coli (Total Coliform Rule)	0 (In the year)	0	A routine sample and a repeat sample detect total coliform and either sample also detects fecal coliform or E. coli	0	Human and animal fecal waste
Fecal Indicators (E. coli, enterococci or coliphage) (Federal Groundwater Rule)	0 (In a month)	0	Treatment Technique (TT) for untreated groundwater	N/A	Human and animal fecal waste

Note: The City of Redding analyzes a minimum of 23 water samples per week throughout the year in the water distribution system for coliform bacteria. A total of 1,268 coliform bacteria monitoring samples were taken during calendar year 2014.

Sampling results showing the detection of Lead and copper

Lead and Copper	No. of Samples Collected	90th Percentile Level Detected	No. Sites Exceeding AL	AL	PHG	Typical Source of Contaminant
Lead (ppb) [July 2013]	30	ND	0	15	< 2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppm) [July 2013]	30	0.28	0	1.3	< 0.17	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

Sampling results for sodium, hardness, and General Chemistry

Contaminant (CCR reporting units)	Sample Dates	Average Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Sodium (ppm)	8/14	17.1	0-17.1	N/A	N/A	Generally found in ground & surface water
Hardness (ppm as CaCO3)	1/14 – 12/14	55.8	12.4 to 105.5	N/A	N/A	Generally found in ground & surface water
Calcium (ppm)	1/14 – 12/14	11.9	5.58 to 23	N/A	N/A	Naturally occurring dissolved mineral
Magnesium (ppm)	1/14 – 12/14	8.28	5.9 to 17.5	N/A	N/A	Naturally occurring dissolved mineral
pH	1/14 – 12/14	7.88	7.61 to 8.16	N/A	N/A	pH 6.5 to 8.5 is typical for drinking water
Alkalinity (ppm as CaCO3)	1/14 – 12/14	71.1	42.2 to 129	N/A	N/A	Measures the buffering capacity of the water

TERMS USED IN THIS REPORT

To help you better understand these terms, the following definitions are provided:

Microbial Contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife;

Inorganic Contaminants, such as salts and metals, that can be naturally occurring or can result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

Pesticides and Herbicides, that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and which can also come from gas stations, urban stormwater runoff, agricultural applications, and septic systems;

Radioactive Contaminants, that can be naturally occurring or can be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

AL (Regulatory Action Level):
The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

MCL (Maximum Contaminant Level):
The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible.

Secondary MCLs (SMCLs) are set to protect the odor, taste and appearance of drinking water.

MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. EPA.

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: Not applicable

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

NS: No standard

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L (picocuries per liter): A measure of radioactivity.

PDWS (Primary Drinking Water Standard): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

PHG (Public Health Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California EPA.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

ppt (parts per trillion): One part substance per trillion parts water (or nanograms per liter).

Detection of contaminants with a Primary Drinking Water Standard

Contaminant (CCR reporting units)	Sample Date	Average Level Detected	Range of Detections	MCL [MRDL]	PHG (MCLG) [MRDLG]	Typical Source of Contaminant
Chlorine (Distribution system)	1/14 – 12/14	0.45	0.29 to 1.3	4.0	4.0	Disinfectant required by regulation to be added to drinking water.
Aluminum (MCL @ 1ppb)	1/12 - 12/12	61.7	52.4 - 71	100	0.6	Erosion of natural deposits; residual from some water treatment process
Arsenic (ppb) (Wells) [1]	3/14 – 10/14	9.25	ND to 12	10	0.004	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes.
Nitrate (ppm as NO3) (Wells and Surface Water)	7, 8, 9, 12/2014	6.1	3.8 - 9.3	45	45	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits. Infants below the age of six months who drink water containing nitrate in excess of the MCL may quickly become seriously ill and, if untreated, may die because high nitrate levels can interfere with the capacity of the infant's blood to carry oxygen. Symptoms include shortness of breath and blueness of the skin. High nitrate levels may affect the oxygen-carrying ability of the blood of pregnant women.
Total Trihalomethanes (Distribution system) (ppb)	Quarterly 2014	Highest: 50.7	0 to 50.7	80	N/A	By-product of drinking water disinfection.
Total of Five Haloacetic Acids – HAA5 (Distribution system) (ppb)	Quarterly 2014	21.3	0 to 36.2	60	N/A	By-product of drinking water disinfection.
Total Organic Carbon (TOC)[2]	Quarterly 2014	0.73	0.4 to 1.2	N/A	N/A	Various natural and man made sources.
Gross Alpha (pCiL)	7/13	0.88	0.88	15	(0)	Erosion of natural deposits.
Radium 228 (pCiL)	8, 9/14	0.6	0 to 1.71	5	0.05	Erosion of natural deposits.
Asbestos (MFL) (Distribution system)	6/08	0.27	0.27	7	7	Internal corrosion of asbestos cement water mains; erosion of natural deposits.
Fluoride	2013	0.1	0.1 to 0.2	2.0	1	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories.

1 Only Enterprise Well No.12 and No.14 have had detections above the arsenic standard. These wells are in the Enterprise pressure zone and are operated on a limited basis during the summer to meet peak water demand and the well water is blended with water from other Enterprise wells to reduce the arsenic below the required MCL. The arsenic MCL was reduced from 50 ppb to 10 ppb on January 23, 2006 by the USEPA.

2 Total Organic Carbon is a precursor for disinfection byproduct formation. The Treatment Technique requirement applies to water filtered from the Buckeye Water Treatment Plant and Foothill Water Treatment Plant.

Detection of contaminants with a Secondary Drinking Water Standard

Contaminant (CCR reporting units)	Sample Date	Average Level Detected	Range of Detections	SMCL	PHG (MCLG)	Typical Source of Contaminant
Aluminum (ppb)	1/12 – 12/12	61.7	52.4 to 71	200	600	Erosion of natural deposits; residual from some water treatment process
Manganese (ppb) (3)	1/14 – 12/14	47.7	0.13 to 125	50	N/A	Leaching from natural deposits
Sulfate (ppm)	8/14	17.1	17.1	500	N/A	Runoff/leaching from natural deposits; industrial waste
Chloride (ppm)	8/14	12.1	12.1	500	N/A	Runoff/leaching from natural deposits; seawater influence
Total Dissolved Solids (ppm)	1/14 – 12/14	113.34	55.9 to 264	1000	N/A	Runoff/leaching from natural deposits
Specific Conductance	1/14 – 12/14	117.94	95.7 to 468	1600	1600	Substances that form ions when in water; seawater influence
Iron (ppb) (3)	1/14 – 12/14	1.8	0 to 215	300	N/A	Leaching from natural deposits; industrial wastes

Several wells in the Enterprise pressure zone have elevated levels of manganese and iron. Polyphosphate is added to sequester these minerals and the water is blended with water from other Enterprise wells to reduce the iron and manganese below the required MCL, and minimize brown water complaints. Water distribution crews have started unidirectional flushing in the Enterprise pressure zone to help minimize these complaints also.

Sampling results for US EPA UNREGULATED MONITORING RULE (UCMR 3)

All Public Water Systems (PWS's) serving 10,000 or more service connections, as the City of Redding, are required by the USEPA to participate in this program. This data serves as a primary source of occurrence and exposure information that the USEPA uses to develop regulatory decisions. Large PWS's pay for their own testing costs.
(Twenty-one unregulated contaminants were analyzed during the 2nd quarter of 2014; the following five contaminants sampled above the MRL)

Contaminant (CCR reporting units)	Sample Dates	Average Level Detected	Range of Detections	MRL	MCL	PHG (MCLG)	Typical Source of Contaminant
Chromium (ppb)	3, 6/14	0.4	0.3 to 0.4	0.2	50	0.04	Discharge from steel and pulp mills and chrome plating plants; erosion of natural deposits
Chromium-VI (ppb)	3, 6/14	0.3	0.09 to 0.33	0.02	10	0.02	Discharge from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, textile manufacturing facilities; erosion of natural deposits
Molybdenum (ppb)	3, 6/14	1.0	<1.0 to 1.4	1.0	N/A	N/A	Does not occur naturally as a free metal, but rather in various oxidation states in minerals
Strontium (ppb)	3, 6/14	126.4	0.37 to 310	0.3	N/A	N/A	Occurs naturally in the minerals celestine and strontianite
Vanadium (ppb)	3, 6/14	2.3	0.4 to 3.9	0.2	N/A	N/A	Occurs naturally in about 65 different minerals and in fossil fuel deposits

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